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Cosmological analysis from the cross-correlation of the CMB gravitational lensing and galaxy surveys

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The effect of gravitational lensing of the Cosmic Microwave Background

(CMB) provides a unique opportunity to obtain a picture of the gravitational potential of the large-scale structure of the Universe at very high redshifts. Tomographic cross-correlation of the gravitational potential with other tracers of the large-scale structure at known redshifts allows tracing the evolution of the structure through estimation of the matter fluctuation amplitude σ_8 , shedding new light on the observed tensions between different estimates of the amplitude. It can also be used for to remove the lensing effect from CMB anisotropy maps and improve constraints on cosmological parameters, in particular the amplitude of the primordial gravitational waves. However, the analysis of the upcoming data requires a very good understanding of any systematic errors that may bias the cross-correlation measurements. In this talk I will show how much the reconstruction of the CMB lensing potential is improved by the tomographic analysis and how much this will affect the estimation of the σ_8 parameter for the upcoming CMB experiments and galaxy surveys.

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